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POLYCHROMATIC PRINTED CORKS AND METHOD FOR MAKING THE SAME

FIELD OF THE INVENTION

The invention is referred to cork, method and machine for printing of polychromatic images on corks and ink cartridge of the machine for printing of polychromatic images, applicable in the manufacture of corks and in polygraphy, especially for simultaneous printing of various colours at making polychromatic images on cylindrical items made of cork, rubber, paper, cardboard, etc.

BACKGROUND OF THE INVENTION

A pattern cork with monochromatic image is known in the art and widely used.

A cork with polychromatic image on it is not known in the art.

A method and a machine for printing of polychromatic images on the surface of a cylindrical item are known in the art wherein the item successively passes through different sections for each colour printing. Colour separation to i colours is previously made, which allows the formation of a polychromatic image by using various basic colours, i.e. the number of colours i = 2 to n. On every i section the item is positioned to the printing element, i.e. printing roller, that sets on the respective colour. In these cases an additional reorientation of the item is additionally made for the exact adjustment of the next colours on the image already placed. The corresponding inks from corresponding ink cartridges are guided through transporting rollers to the work sectors of the printing rollers. Each roller has a non operating sector that prevents from laying on the images at full turn of the printed cylindrical surface [1].

A shortcoming of the known method and machine for printing of

polychromatic images on the surface of a cylindrical item is that these are intended for pattern items with calibrated and fixed dimensions. that is why their use for polychromatic printing over non calibrated cylindrical items of cork, rubber, paper, cardboard and others leads to a low quality printing due to the impossibility these items to be reoriented precisely from sector to sector.

A method and a machine for monochromatic printing of images over cylindrical items is known wherein the image is placed by means of monochromatic printing, including thermoprinting.

A shortcoming of the known method and machine for monochromatic printing of images over cylindrical items is that for printing polychromatic images on the cylindrical items it is necessary to transfer them successively to various machines for monochromatic printing observing measures for exact positioning. That is why their use for polychromatic printing on non-calibrated items of cork, rubber, paper, cardboard, etc. leads to low quality printing, because it results impossible to reorientate these items with precision from machine to machine.

An ink cartridge for printing images is known in the art, consisting of internal cylindrical vertical ink container with a vertical row of tangential nozzles of one of its sides. A vertical agitator in the container is touching closely its frontal surface to the inner surface of the deposit and at rotating with each turn force the pushing of ink portions through the nozzles. The revolutions of the agitator determine the ink output through the nozzles, for which the change of the desired output is effected replacing the operating kinematic couple of gears in off position. In order to maintain the necessary high quality ink layer, the container should be always full to the level of the upper nozzle. So the container should be continuously refilled with ink. The cylindrical volume of the container is placed in a prismatic shell, fixed to a rotating plate. The nozzles are placed in

this shell and from its head the ink is passed to transporting rollers.

A disadvantage of the known ink cartridge is that it gives a low quality print when the ink level in the ink cartridge falls under the critical level of the upper nozzle. This makes it necessary to keep up a relatively large quantity of ink in the cartridge, which is lost when a cleaning and adjustment of the ink cartridge is to be made. Another shortcoming is the rough distribution of the ink, because it is impossible to set them closer at their linear positioning under a determined constructive minimum of the distance between the nozzles. These disadvantages make the known nozzle difficult to apply in machines for polychromatic printing on non-calibrated cylindrical items made of cork, rubber, paper, cardboard, etc.

Task of the invention is to create an industrially made cap with a high quality polychromatic image.

Task of the invention is to create a method and a machine for high quality printing of polychromatic images on cork.

Task of the invention is to create an ink cartridge for polychromatic printing machine for corks with high quality delivery of the ink.

TECHNICAL DESCRIPTION.

This task is solved by creating a cork with colours forming a polychromatic images on its cylindrical surface.

A method for printing of polychromatic images on cork is created, wherein colours separation has previously been made, that by using *n* basic colours allows the formation of polychromatic image. The corks are delivered to an operating zone, and the corresponding inks according to the number of the basic colours are conducted to printing rollers by means of transfer rollers. By oscillation, inks are spread over the cylindrical surface of the cartridges for the achievement and the maintenance of a regular ink layer. Corks are successively supplied one after the other vertically in the operating zone by gravitation.

The cork that will be printed is fixed with its axis in vertical position with the possibility of unlimited rotation around the axis of its cylindrical surface, establishing simultaneous contact with radially placed fixing devices along the effective diameter of the cork, by which all fixing devices come into contact in their corresponding contact points thus eliminating the deviations in the cylindrical shape of the surrounding surface of the cork. Then all printing rollers with diameter equal to the diameter of the cork enter into simultaneous contact with the cylindrical surface at the level of the effective diameter of the cork. Follows a simultaneous rotation of the cap at one revolution by the fixing devices, that make the turn along with the printing rollers at equal peripheral speed in their contact points with the cork surface. All printing rollers spread simultaneously the print of the corresponding colour on the colour zone of the cork surface corresponding to each roller, according to the previous colour separation, and at the end of the turn, the polychromatic image on the surface of the cork is fully made. Then all printing rollers and fixing devices are drawn back from the cork, its axis is released and is pulled back from the operating zone. In the interval to the next loading of the operating zone, the printing rollers make contact with the transporting rollers to cover their printing relief with the corresponding ink colour, and during the printing interval, when the printing rollers are not in contact with the transporting rollers, the latter make contact with intermediate rollers that are in constant contact with the supply surface of the corresponding ink cartridges for each colour and transfer ink to the corresponding intermediate rollers during the whole rotation of each ink cartridge 4_i. All the time, the thickness and regularity of the ink layer on its transferring surface is additionally maintained within the normal range by oscillating spread. The axis of at least one printing roller during the printing process is fixed strongly in radial position to the cork, and the axis of

the remaining printing rollers exercise a selective radial pliability to the cork surface.

According to the method it is possible that the axis of all printing devices make selective radial pliability to the cork surface.

A polychromatic image printing machine on cork is also created. consisting of *n* printing rollers, ink cartridge, fixed to the base of the machine, and transferring, and intermediate rollers, wherein *n* is the number of colours of the colour separation. Over the operating zone there is a vertical floating magazine, and under the operating zone there is an orifice to a chute. A mobile vertical support with vacuum catch of its upper edge is aligned to the axis of the operating zone and passes through the orifice, an in upper end position contacts the cork with the vacuum catch, and in the lower end position is under the level of the orifice. Thus *m* fixing rollers are placed vertically with rotation axis parallel to the axis of the operating zone. In printing mode, the printing roller and the fixing rollers are positioned to the effective diameter of the cylindrical surface of the cork. The axis of at least one printing roller is fixed firmly in radial position to the cork. The axis of the other printing rollers have a selective radial pliability to the cork surface, and the printing rollers are not in contact with the transporting rollers, the latter being in contact with the intermediate rollers, that are in permanent contact with the spreading surface of the corresponding ink cartridges for each colour. In recharging mode, all printing rollers and fixing rollers are set aside the cork, the printing rollers are in contact with the corresponding transporting rollers, and the latter are not in contact with the intermediate rollers. Every ink cartridge has an oscillating roller with axis parallel to the axis of the ink cartridge, and outer surface being in permanent contact with the spreading ink cartridge surface. The axis of this oscillating roller is connected to the axis of the worm of a worm reductor, its worm-wheel being connected to an eccentric lever

fixed to a support of the oscillating roller. The axis of every fixing roller is articulated through a slide, which is placed into a channel formed by support sectors, and a leading roller, fixed to the lower part of the slide, is placed into a guiding channel in rotating leading synchronized disk which rotation axis fits in the axis of the operating zone. A chain wheel fixed to the synchronizing disk by first leading chain is connected to the engine axis providing radial movement of the pressing rollers to and from the effective diameter of the cork. The axis of every pressing roller under the slide is articulated in the internal part of an arm, which external end is articulated to an arm. freely articulated on a central axis, articulated in the carcass of the machine, wherein the central axis is articulated along a second axis in which lower end are located two gear-wheels, and in their upper end is located a gear-wheel, that through a second chain is connected to a gear-wheel, fixed to the axis of the printing head. An engine for rotation of one cycle by third chain is connected to the gear wheels of all second axis, which lower gear-wheels through their corresponding fourth chains are connected to lower gear-wheels on axis, positioned along the axis in the axis of the articulations between the arms, upper gear wheels of the axis are connected with fifth chains to their corresponding gear-wheels in the lower end of the axis of the fixing rollers. At least one central axis is connected to the corresponding leading fork in which channel is located a pin, eccentrically positioned to the axis of the engine for putting it in motion. To every central axis is fixed a curved arm support for the corresponding printing roller, articulated in its curved edge, the arms being kinematically connected and synchronized thorough their corresponding gear-wheels, fixed to the central axis and wrapped by a sixth chain. A supporting fork is freely articulated under every arm support towards its central axis, an eccentric stop being installed to the fork, being the arm of the stop articulated to the arm support. A leading pneumatic cylinder is

articulated between the fork and the arm. A fork for the intermediate roller and the support, made as a fork, for the oscillating roller are articulated to the fork, and the rollers placed over them are constantly pressed to the cylindrical surface of the ink cartridge by means of a spring between both forks.

It is possible that in the machine for printing of polychromatic images on cork all central axis grasped by the sixth chain to be connected through it directly to the axis of the oscillating engine.

It is possible that in the machine for printing of polychromatic images on cork all gear belt washers of the ink cartridges to be grasped by a gear belt, connected through a support roller with a gear belt wheel to the engine axis for setting them in motion.

It is possible that in the machine for printing polychromatic images on cork the magazine consists of *j* guides, forming a vertical channel, and every guide has at any edge one adjustable support, and at least one of these guides is mobile and is provided of a guiding element, its internal surface having a projection for contact with the cork that is on the exit of the vertical channel.

It is possible that every adjustable support consist of slide for connecting to the corresponding guide, pressed by a spring into a cylinder and supporting with its head an adjusting screw.

An ink cartridge is created for machine of polychromatic image printing on corks, consisting of shaft and vertical tank of internal cylindrical volume for the ink and nozzles on its wall. The vertical tank is a cylinder and is placed axially to the head of the shaft. The nozzles are radial and are symmetrically positioned along *N* screw lines, regularly spread over the tank surface. It has an axial core with the form of two-stage cylinder, having a smaller diameter and forming a peripheral hollow ring with the inner surface of the tank, and its second stage has a diameter equal to the inner diameter of the cylindrical volume with a small installation gap and inner chamber

with the shape of an open frustum of a cone and slots to the hollow ring. On the tank and the chamber there is a lid with orifice in the center.

An advantage of the cork is that it has a high quality polychromatic image an that is industrially made.

An advantage of the method and the machine for printing polychromatic images on cork is that they provide high quality printing.

An advantage of the ink cartridge for machine of printing polychromatic images on cork is that it provides a high quality ink supply.

DESCRIPTION OF THE FIGURES ATTACHED

The invention is clarified in details with and example of the cork, the machine that makes effective the method for printing polychromatic images on cork and ink cartridge for the machine for printing polychromatic images, shown on the figures, wherein:

Figure 1 is colour picture of a number of corks with polychromatic images on them.

Figure 2 is principal scheme of the elements distribution in the operating zone of the machine while printing.

Figure 3 is a drawing of the machine while printing.

Figure 4 is drawing of the machine while changing the cork.

Figure 5 is a frontal view of the machine elements while printing with a rotation trajectory of the printing rollers movement.

Figure 6 is a frontal view of the elements of the same machine while the cork is changed.

Figure 7 is a frontal view on the distribution of the fixing elements while printing.

Figure 8 is a transverse section of the machine along AA of Figure 7.

Figure 9 is a scheme of the elements in the machine at a linear trajectory of printing rollers movement.

Figure 10 is a section of the ink cartridge.

Figure 11 is a unfold of the cylindrical surface of the ink cartridge with the nozzles spread on it.

EXAMPLE

The corks 1 on fig. 1 are with colours 2, forming a printed polychromatic image 3 on their cylindrical surface.

The polychromatic image printing machine on cork 1 on the figures consists of printing rollers 6_i, i = 1 to *n*, an ink cartridge 4_i, fixed to the base of the machine, and transferring 5_i, and intermediate 8_i rollers, wherein *n* is the number of colours 2 of the colour separation. Over the operating zone there is a vertical floating magazine 9, and under the operating zone there is an orifice 10 to a chute 11. A mobile vertical support 12 with vacuum catch 13 of its upper edge is aligned to the axis of the operating zone and passes through the orifice 10, an in upper end position contacts the cork 1 with the vacuum catch 13. and in the lower end position is under the level of the orifice 10. Fixing rollers 7_j where j = 3 to *m* are placed vertically with rotation axis parallel to the axis of the operating zone. In printing mode, the printing rollers 6_i and the fixing rollers 7_j are positioned to the effective diameter of the cylindrical surface of the cork 1. The axis of at least one printing roller 6 is fixed firmly in radial position to the cork 1. The axis of the other printing rollers 6 have a selective radial pliability to the cork 1 surface, and the printing rollers 6_i are not in contact with the transporting rollers 5_i, the latter being in contact with the intermediate rollers 8_i, that are in permanent contact with the spreading surface of the corresponding ink cartridges 4_i for each colour. In recharging mode, all printing rollers 6_i and fixing rollers 7_j are set aside the cork, the printing rollers 6_i are in contact with their

corresponding transporting rollers 5_i, and the latter are not in contact with the intermediate rollers 8_i. Every ink cartridge 4_i has an oscillating roller 14 with axis parallel to the axis of the ink cartridge 4, and outer surface being in permanent contact with the spreading ink cartridge 4 surface. The axis of this oscillating roller 14 is connected to the axis of the worm 15 of a worm reductor 16, its worm-wheel 17 being connected through an eccentric lever 18 fixed to a support 19 of the oscillating roller 14. The axis of every fixing roller 7 is articulated through a slide 20, which is placed into a channel 21 formed by support sectors 22, and a leading roller 23, fixed to the lower part of the slide 20, is placed into a guiding channel 24 in rotating leading synchronized disk 25 which rotation axis fits in the axis of the operating zone. A chain wheel 26 fixed to the synchronizing disk 25 by first leading chain 27 is connected to the engine axis 28 providing radial movement of the pressing rollers 7 to and from the effective diameter of the cork 1. The axis of every pressing roller 7 under the slide 20 is articulated in the inner edge of an arm 29, which outer end is articulated to arm 30, freely articulated on a central axis 31, articulated in the carcass of the machine, wherein the central axis 31 is articulated along a second axis 32 in which lower end are located two gear-wheels 33 and 34, and in their upper end is located a gear-wheel 35, that through a second chain 36 is connected to a gear-wheel 37, fixed to the axis 38 of the printing head 6. An engine for rotation of one cycle 39 by third chain 40 is connected to the gear wheels 33 of all second axis 32, which lower gear-wheels 34 through their corresponding fourth chains 41 are connected to lower gear-wheels 42 on axis 43, positioned along the axis in the axis 44 of the articulations between the arms 29 and 30, upper gear wheels 45 of the axis 43 are connected to fifth chains 46 to their corresponding gear-wheels 47 in the lower end of the axis of the fixing rollers 7. At least one central axis 31 is connected to the corresponding leading

fork 48 in which channel 49 is located pin 50, eccentrically positioned to the axis of the engine 51 for putting it in motion. To every central axis 31 is fixed a curved arm support 52 for the corresponding printing roller 6, articulated in its curved edge, the arms 52 being kinematically connected and synchronized thorough their corresponding gear-wheels 53, fixed to the central axes 31 and wrapped by a sixth chain 54. A supporting fork 55 is freely articulated under every arm support 52 towards its central axis 31, an eccentric stop 56 being installed to the fork, being the arm 57 of the stop articulated to the arm support 52. A leading pneumatic cylinder 58 is articulated between the fork 55 and the arm 52. A fork 59 for the intermediate roller 8 and the support 19, made as a fork 60, for the oscillating roller 14 are articulated to the fork 55, and the rollers 8 and 14 placed over them are constantly pressed to the cylindrical surface of the ink cartridge 4 by means of a spring 61 between fork 59 and fork 60.

It is possible that in the machine for printing of polychromatic images on cork 1 all central axis 31 grasped by the sixth chain 54 to be connected through it directly to the axis of the oscillating engine 51.

It is possible that in the machine for printing of polychromatic images on cork 1 all gear belt washers 62 of the ink cartridges 4 to be grasped by a gear belt 63, connected through a support roller 64 with a gear belt wheel 65 to the engine axis 66 for setting them in motion.

It is possible that in the machine for printing polychromatic images on cork 1 the magazine 9 consists of various guides 67_j, forming a vertical channel 68 , and every guide 67 has at any edge one adjustable support 69, and at least one of these guides is mobile and is provided of a guiding element 70, its internal surface having a projection 71 for contact with the cork 1 that is on the exit of the vertical channel 68.

It is possible that every adjustable support 69 consists of slide 72

for connecting to the corresponding guide 67, pressed by a spring 73 into a cylinder 74 and supporting with its head an adjusting screw 75.

The ink cartridge on figures 10 and 11 for machine of polychromatic image printing on cork 1 consists of shaft 76 and vertical tank 77 of internal cylindrical volume 78 for the ink 79 and nozzles 80 on its wall. The vertical tank 77 is a cylinder and is placed axially to the head of the shaft 76. The nozzles are radial and are symmetrically positioned along N screw lines, regularly spread over the tank surface 77. It has an axial core 81 with the form of two-stage cylinder, its stage 82 having a smaller diameter and forming a peripheral hollow ring 83 with the inner surface 77 of the tank, and its second stage 84 has a diameter equal to the inner diameter of the cylindrical volume 78 with a small installation gap and inner chamber 85 with the shape of an open frustum of a cone and slots 86 to the hollow ring 83. On the tank 77 and the chamber 85 there is a lid with orifice in the center.

APPLICATION OF THE INVENTION

he machine performing the method for printing of polychromatic images on cork is as follows:

According to the method for printing of polychromatic images on cork 1 a colour separation is previously made, which allows by using various basic colours 2_i where $i = 2$ to n to obtain a polychromatic image 3.

Initially the magazine 9 is charged with a vertical column of corks 1 (figure 3), the guiding element 70 through its projection 71 of the arm 67 is pressing the lowest cork 1 and prevents their fall by gravitation.

The mobile vertical support 12 is in upper position and its vacuum catch 13 is at a distance equal to one length of the cork 1 from the

head of the lower cork 1 and the magazine 9. The channel 68 adjustment for the corresponding size of corks 1 is effected by the adjusting supports 6 by rotating their adjustable screws 75, that by establishing a frontal contact with the slides 72, under the action of the springs 73 in the cylinders 74 leave a different radial gap of the cork 1 flow in the vertical channel 68. They also provide the alignment of this flow to the axis of the operating zone. The adjusting rollers 7 and the printing rollers 6 are opened and allow free displacement of the corks 1 along the axis. When the leading element 70 draws laterally the lower part of the arm 67 with the projection 71, the latter releases the whole column of corks and the lower cork 1 falls over the head of the vacuum catch 13. Then (figure 7) through the engine 28, the first chain 27, the gear-wheel 26, the leading synchronizing disk 25, the leading rollers 23, displacing along the channels 24, and the slides 20, displacing in the channels 21, formed by the sectors 22, the fixing rollers 7 displace radially in a synchronic way until a contact with the surface of the cork 1 is established along its effective diameter, i.e. along the diameter providing a simultaneous contact of all fixing rollers 7 with the cork 1 surface. This is to overcome the possibility of displacement of the cork 1 rotation axis during the printing process, due to the deviation and the cylindric shape. Its rotation axis coincides with the axis of the machine operating zone. While the fixing rollers 7 press the cork 1, under their action it also rotates, which helps for its precise positioning in the operating zone. After the fixation is over, the leading element 70 (figures 3 and 4) sets back the lower part of the arm 67 with the projection 71, which presses the next cork 1, that serves as upper support of the cork 1 in the operating zone and is ready for the next loading. The engine 28 is oscillating and is operated on a previously determined angle, corresponding to the cork 1 diameter, after which it stops.

During the fixation (figures 5 and 6) under the action of the leading pneumatic cylinder 58 the fork 55 is displaced along with the transporting rollers 5, which get separated from the intermediate rollers 8 and establish a contact with the printing rollers 6. This contact is of previously determined penetration depth of the printing profile of the printing rollers 6 in the rubber surface of the transporting rollers 5. This is made by the arm 57 and the eccentric stop 56. Then the engine 39 through its third leading chain 40, the gear wheels 33 on the second axis 32 with the gear wheels 35, the second chain 36, the gear wheel 37 and the axis 38 turns the printing rollers 6 at two cycles until the ink is fully spread over their printing profiles with ink of the transporting rollers 5 and then stops (figure 7).

In order to perform the printing (figure 7) the engine 51, through the roller 50 on its axis, the fork 49 and the arm 48 rotates one of the central axes 31, and the remaining axes 31 are rotated in a synchronous way by gear wheels 53 and the sixth chain 54. The process is effected until the printing heads 6 reach the effective diameter of the cork 1 in the operating zone. Meanwhile (figure 5) the pneumatic cylinders 58 displace the forks 55 with the transporting rollers 5 to the intermediate rollers 8 until a contact with their surface is established. The engine 51 is oscillating and rotates to a previously formulated angle the printing rollers 6 for establishing their contact with the cork 1 along the effective diameter and stops.

The ink cartridges 4 (figure 10) are in a continuous rotation (figures 3, 4, 7), effected through the engine 66, the gear belt washer 65, grasping the gear belt 63 and the corresponding gear belt washers 62 and the shafts 76. Thus the ink 79 under the action of the centrifugal force passes from the internal chamber 85 of the vertical tank 77 through the slots 86 in the peripheral ring hole 83, formed by the difference in the diameters of the stages 84 and 82 of the core 81, and passes through the nozzles 80. The difference in the diameter

of the stages 84 and 82 is selected in such a way that the ink flow is not regulated at any operating mode of the machine. The sections of the nozzles 80 is in accordance with the ink viscosity 79 and prevents its free flow under a defined value of the cycles. The distribution of the nozzles 80 (figure 11) guarantees a regular and continuous supply of ink 79 to the spreading ink cartridge 4 surface. On this surface, by a continuously rotating and oscillating roller 14 is effected the regular distribution of the ink 79. The oscillating roller 14 is operated by the ink cartridge 4 (figures 3 and 4), the worm 15, the worm wheel 17 of the reductor 16 with the lever 18 to the support 19. The air pressure of the chamber 85 should be equal to the atmospheric for providing a precise adjustment of the flowing ink 79, which is made through the orifice 88 of the cork 87.

During the contact of the ink cartridge 4 surface with the intermediate roller 8 surface the ink 79 is transferred to it. As the intermediate rollers 8 are in a continuous contact with the transporting rollers 5 the ink is transferred to their surface too.

The maintaining of a constant contact between the surfaces of the ink cartridge 4, the intermediate roller 8, articulated on the fork 59 and the oscillating roller 14 is effected by the spring 61, connecting arms 59 and 60.

After rollers 6 have entered into contact with cork 1, the polychromatic printing is effected, all printing rollers 6 and fixing rollers 7 are rotated unidirectionally in a synchronous way by the engine 39. During the printing process the cork 1 makes a full cycle (figure 2), after which the engine 39 stops. The rotation is transferred from the engine 39 through the third chain 40, the gear wheels 33, 34 and 35 over the axes 32, the movement being distributed towards the fixing rollers 7 (figure 7) through the gear wheel 34, the fourth chains 41, the wheels 42 and 45, rotating along with the axes 43, articulated in the axes 44, forming the articulation between arms 29 and 30, the

fifth chains 46, the gear wheels 47 to the fixing rollers 7, and the printing rollers 6 (figure 7) through the gear wheels 35, the second chains 36, the gear wheels 37 over the axes 38 of the printing heads 6.

As the movement is synchronous, all printing rollers 6 are making their corresponding colour 2 imprint simultaneously on the cork surface 1 in their corresponding colour zone, according to the previously made colour separation, and thus form a polychromatic image 3 on the cork 1 surface. This is illustrated on figure 2 where the points a, b, c, d indicated for better understanding on all rotating elements and the cork are positioned at equal angle intervals and during their rotation are always in contact with the same points of cork 1.

When the machine is in a selective pliability mode (figure 5), some of the printing rollers 6 under the action of the external force influence at entering into contact with the cork 1 displace along its surface with a relatively constant pressure within the range of the elastic deformation of the sixth chain 54. Thus the real profile of the cork 1 is followed by the printing rollers 6= Those of the rollers that have no selective pliability, determine the zone of selective pliability.

In the version of figures 5, 6 the movement of the printing heads to the cork 1 is effected following a circumference trajectory. A version of the machine is possible displacing the printing heads along a linear trajectory (figure 9).

After the printing is over, the printing rollers 6 and the fixing rollers 7 draw back from the cork 1. This is made by a reverse displacement of the oscillating engines 28 and 51 with their related kinematic chains described above.

A subpressure in the vacuum catch 13 is formed simultaneously, the cork 1 is hold by it (the figures do not show the vacuum generator). The mobile vertical support 12 slides down through the orifice 10

(figure 4) while the cork 1 heats its rib and falling down the conducting chute 11, leaves the machine.

Then the subpressure supply to the vacuum catch 13 is turned off, and the vertical support 12 returns to its upper end position and the cycle is repeated again.

The machine operation is effected by means of standard electronics not shown on the figures.